An Empirical Evaluation of the Effectiveness of Audit Committees in terms of Earnings Quality

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Contents

1. Introduction

Recommendation committees such as Blue Ribbon Committee (1999) and extant empirical research (Baxter & Cotter, 2009; Klein, 2002; Abbott, Parker & Peters, 2004) indicate that audit committees as an important component of corporate governance mechanism, ought to assist the improvement of quality of financial reporting practices inclusive of earnings quality. Meanwhile, in the Japanese context, the corporate governance reforms movement that began from 1997 has introduced number of reforms to the traditional corporate governance mechanism (Saito, 2009; Hirata, 2004; Gilson & Milhaupt, 2005). Further, in 2002, the revised Commercial Code of Japan allowed the adoption of US style committee system of which an audit committee is an important committee. Up to date, limited number of firms had followed this allowance and had adopted the committee system in the Japanese corporate sector.

Taking the above factors in to consideration, the contemporary Japanese corporate context provides a unique opportunity to evaluate the effectiveness of audit committees over the traditional corporate auditor system. Hence, this research uses alternative accruals based proxy models to operationalize earnings quality as the basis for evaluation and comparison of firms who have adopted audit committees with firms who have not adopted such committees

for the period 2007 to 2009, and listed in Tokyo Stock Exchange.

The contemporary phenomenon of introduction of committee system into the Japanese corporate sector and the lack of extant empirical studies in Japan that uses *earnings quality* as a basis of evaluation and comparison is expected to provide a unique contribution and distinguishes this research from extant contemporary studies.

In terms of findings, it is observed through the multivariate regression analyses that there is no statistically significant relation between earnings quality and existence of audit committees. Hence, it is not able to conclude that firms having audit committees have superior earnings quality than firms that have not adopted audit committee system (i.e. firms with traditional corporate auditor system) in terms of accrual proxied quality of earnings, even after controlling for alternative explanations. The observed lack of statistical significance leads to another inference that objective, resources and expertise of an audit committee as a *financial monitor* may differ from the US context. The emphasis on *independence* (by mainly deploying outside directors in audit committees) seems overshadowing the role of an audit committee as a *financial monitor.*

It should be noted that the findings of this study is expected to have significant policy implications over the deployment of appropriate directors to corporate boards in enhancing broadly the financial reporting function as well as more specifically the earnings quality of firms they serve.

The remainder of this paper is structured as follows: Section 2 discusses the recent Japanese corporate governance reforms, extant literature on relation between audit committees and quality of earnings and indicates the development of the research hypothesis tested under this study. The research methodology that is implemented in testing the developed research hypothesis is indicated in Section 3, and Section 4 elaborates the main findings of the study with an accompanying discussion. Section 5 introduces additional tests for the robustness while Section 6 summarizes the findings and concludes the research study at the end.

2. Literature Survey

2.1 Japanese Corporate Governance Reforms

Saito (2009); Gilson and Milhaupt (2005); Hirata, (2004), indicate that as a response to declining corporate performance, escalation of corporate scandals and less effective traditional

governance system, the Japanese corporate governance reforms movement commenced in 1997.

Yoshikawa, Tsui-Auch and McGuire (2007); Saito (2009), further indicate that Sony in 1997 was the first to introduce the US style board system by introducing outside directors and reducing the board size. In line with these reforms, the Commercial Code of Japan was amended in 2002, which allowed the adoption of the committee system that is a prominent feature in the Anglo-American model of corporate governance (Hirata, 2004; Saito, 2009). This allowed establishing audit committees (amongst other committees: nomination committee and compensation committee) with outside directors, instead of the traditional auditor system. The amended Code required at least three members of such committees of which majority being outside directors.

Yoshikawa, Tsui-Auch and McGuire (2007), however, indicate that, successful firms as Sony and its followers of Anglo-American model of corporate governance, *selectively* adopted features to fit their own situations and *did not* adopt the US governance system *as is*.

The recent reforms that allow the introduction of audit committees and differences in their adoption provide a unique opportunity to investigate their effectiveness over the traditional governance mechanism (i.e. traditional corporate auditor system). Hence, this study attempts to evaluate empirically the effectiveness of audit committees in a financial perspective. Next section elaborates the relation between audit committees and earnings quality.

2.2 Audit Committees and Earnings Quality

He et al. (2008) indicate that audit committees are generally considered as an important component of a firm's overall governance mechanism with particular emphasis on audit quality and *oversight of financial reporting*. They explain further that audit committees make recommendations to the board on the selection of an external auditor, liaison between senior financial managers and external auditor on issues such as the financial statements, audit process and internal controls, as well as oversee internal auditors, external auditors, and management to ensure that they act on the best interest of the shareholders. Moreover, recommendation committees such as Blue Ribbon Committee (1999) and extant research (see Baxter & Cotter, 2009) indicate that audit committees assist in improvement of the quality of financial reporting practices as well as quality of earnings.

As indicated in the introduction, the lack of studies that evaluates the effectiveness of audit committees based on earnings quality is specifically noted related to the Japanese

context. There are few studies investigating the relation between corporate performance and the committee system based governance mechanism, however. In one of the extant studies, Bebenrotha and Donghaob (2007) find that Japanese firms having committee styled system showed strongest performance (performance defined based on *Tobin's Q*) while traditional styled firms (i.e. firms with no outside directors at all in their boards) showed the weakest performance. Further, they indicate that firms who had outside directors in their boards (but had not adopted the committee styled system) had a mid-level of performance.

Extant empirical research related to international context that investigates the relation between audit committees and earnings quality is of diverse in nature and provides mixed results. In their meta-analysis, Lin and Hwang (2010) provide an insightful empirical investigation on the impact of audit committees (amongst other elements of governance mechanism) by analyzing several empirical studies published so far. Their conclusions can be summarized as follows: the impact of the existence of audit committee on earnings quality has mixed results and further research needs to be performed on this dimension; the independence of the audit committee members is significantly associated with higher earnings quality; higher number of audit committee meetings is positively associated with earnings quality; the size of the audit committee has a significant impact on the quality of earnings; the financial expertise of the audit committee members has a significant positive impact on the earnings quality; and finally, stock ownership of audit committee members also has a significantly positive association between the earnings quality.

Based on this extant literature, we could reasonably expect a positive relation between existence of audit committees and quality of earnings. The next section develops the related hypothesis based on this postulate.

2.3 Research Hypothesis

The discussion so far on the contemporary Japanese corporate governance reforms, as well as the positive relation established in extant empirical research between existence of audit committees and earnings quality, poses an interesting empirical research question as: whether the existence of audit committees leads to significantly higher quality of earnings of firms compared to firms that do not have audit committees (i.e. firms with traditional corporate auditor system) in Japan? Based on this research question, following hypothesis is formulated and tested under this research:

H1: Firms with audit committees have significantly superior earnings quality compared to firms that do not have audit committees (i.e. firms with traditional auditor

system).

Section 3 that follows describes the research design and strategy implemented in testing the above hypothesis.

3. Research Design

This section elaborates the details pertaining to the data, selection of the sample, models utilized in operationalizing the research question and strategy in testing the research hypothesis.

3.1 Data and Sample Selection Strategy

NEEDS FinancialQuest database published by Nihon Kezai Shinbun Inc. was primarily used to extract consolidated financial data for industrial companies [1] pertaining to fiscal years: 2007 to 2009 (the fiscal year end was considered as any period within this fiscal year range). Further, data related to audit committees and directors were secured from NEEDS-Cges (Nikkei Economic Electronic Databank System - Corporate Governance Evaluation System) database published by Nikkei Digital Media Inc.

The total number of firm-year observations that had audit committees and were listed in Tokyo Stock Exchange for the period 2007 to 2009 were 145 firm-years as per the NEEDS-Cges database and these firm-years had to be scaled down to 84 firm-year observations due to the requirement that selected firm-year observations should have corresponding information that could be used to estimate related earnings quality proxy measures. Moreover, firms that had established audit committees during the period of 2007 to 2009 were excluded, as they do not have a sufficient period to make an impact over the earnings quality during its short period of existence. It is further noted that the majority of the selected sample had established their audit committees in 2003. Accordingly, 84 firm-year observations were extracted based on firms having audit committees. Further, corresponding to this sample, 84 firm-year observations of firms that do not have audit committees (and listed in Tokyo Stock Exchange) were selected as the matching sample to represent the traditional auditor based system. As per the extant literature (see Lin, Li & Yang, 2006) the matched firms were selected based on the similar book value of the average total assets, listed in the same industry sector [2] and corresponding to the same fiscal period. Hence, the total sample consists of 168 firm-year observations for the period 2007 to 2009.

The next section elaborates the definitions, models, and related measures used for the purpose of operationalizing and testing of the research hypotheses indicated in Section 2.3.

3.2 Definitions, Models and Operationalizations

3.2.1 Decomposition of Accruals

In financial accounting, the relation among earnings, cash flows and accruals can be depicted using equation ***(Eqn. a)*** as:

$$Earnings_t = Cash\ Flows_t + Accruals_t \qquad \textbf{(Eqn. a)}$$

In estimating accounting accruals for research purposes, Hribar and Collins (2002) indicate that extant empirical research generally has followed two approaches, i.e. an indirect balance sheet approach that uses balance sheet amounts for the estimation and a direct cash flow statement approach. They indicate that although majority of studies uses the indirect balance sheet approach, it suffers from an articulation problem between changes in balance sheet working capital accounts and the accrual elements of revenue and expenses of the income statement. They empirically provide overwhelming evidence that due to this issue, the indirect balance sheet approach introduces estimation errors, and consequently researchers may come into *incorrect conclusions* (especially in the presence non-operating events such as mergers and acquisitions, accounting changes or discontinued operations). Therefore, to estimate total accruals, this research uses the direct cash flow statement approach as indicated in following equation ***(Eqn. b)***:

$$Total\ Accruals_t = Earnings_t - Cash\ Flows_t \qquad \textbf{(Eqn. b)}$$

Total accruals (denoted herein forth as: $TACC_t$ [3]) that is estimated using equation ***(Eqn. b)*** is used as an input of the Modified Jones model elaborated in Section 5.2 to estimate discretionary-accruals that is used as an accrual based earnings quality proxy. Net income adjusted with extraordinary losses and gains (hereafter denoted as $EBEI_t$) is used as earnings as per Hribar and Collins (2002).

Further, as a matter of robustness, for estimating an alternative earnings quality measure, which is based on the model of Dechow and Dichev (2002), the change in working capital (i.e. short-term accruals) are estimated and is used as an input for the model under Section 3.2.4. Equation [***Eqn. c***]) below is used to estimate the required change in working

capital (Ebihara et al., 2010).

Change in working capital (herein forth denoted as ΔWC_t [3]) = *ΔCurrent assets – ΔCash & deposits – ΔShort-term investment securities – ΔShort-term loans receivable – (ΔCurrent liabilities – ΔShort-term loans payable – ΔCommercial papers – ΔCurrent portion of the long-term loans payable – ΔCurrent portion of the bonds and convertible bonds)*

(*Δ* is the change in a selected accounting figure from year *t–1* to year *t*.)

(Eqn. c)

The model of Dechow and Dichev (2002) is based on how well the change in working capital (i.e. short-term accruals) that are estimated based on the balance sheet elements are mapping with the past, present and future operating cash flows of the cash flow statement [4]. Any incongruence (i.e. mapping error) is taken as a measure to represent quality of earnings under that model (see **[*Eqn. 1*]** and explanation in Section 3.2.4).

3.2.2 Defining Earnings Quality

Dechow, Ge and Schrand (2010) view *quality* of earnings as a function of a firm's fundamental performance and define earnings quality as; "Higher quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker" (Dechow et al., 2010, p. 1).

After reviewing over 300 empirical studies, they summarize that extant researchers have used different earnings quality proxies such as earnings persistence, accounting accruals, smoothness, timeliness, loss avoidance, investor responsiveness, as well as internal indicators as re-statement and SEC enforcement releases. They, however, indicate that they are not in a position to arrive at a single conclusion on what earnings quality is as quality depends on the context of the decision-making. Hence, it can be noted that the proxies used in extant literature measure different dimensions of earnings quality and may represents different decision contexts [5]. Next section explains the empirical models that are used to proxy: earnings quality.

3.2.3 Alternative Earnings Quality Models and Measures

Conventionally, different variants of the Jones (1991) model have been used to operationalize earnings quality. However, it has been subjected to criticisms (Dechow, Sloan &

Sweeney, 1995; Bernard & Skinner, 1996; Larcker & Richardson, 2004). Review of empirical literature reveal that the model of Dechow and Dichev (2002) – herein forth referred as the D&D model – measures earnings quality in terms of the mapping between short-term accruals and cash flows. Further it is noted that variants of the D&D model is gaining prominence in recent research as a more valid measure (see Francis et al., 2004; Aboody, Francis, Olsson & Schipper, 2005; Dhaliwal, Naiker & Navissi, 2006).

Hence, due to these facts and for the purposes of variation and robustness, in this research, both the cross-sectional version and the robust (original) time-series version of the D&D model is being suggested and used as primary accrual based proxies for earnings quality.

This dual operationalization of the construct of earnings quality is expected to result in a higher robustness of findings and therefore is expected to make the study quite distinct and unique. The specific operationalization aspects of these cross-sectional and time-series versions of the D&D model are elaborated in the next section.

3.2.4 The D&D model based measures as proxies for Earnings Quality

Dechow and Dichev (2002) explains that the residual term obtained by regressing equation (***Eqn. 1***) below, by definition, is the difference between the amount accrued and the amount realized. By furthering this argument, they suggest that the standard deviation of the residual term as a measure of accruals quality and thereby established a proxy for earnings quality. Hence, Dechow and Dichev (2002) introduced the following model (***Eqn. 1***) in ascertaining estimation errors on a firm-specific basis.

$$\Delta WC_t = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon_t \qquad \textit{(Eqn. 1)}$$

Where [3]: ΔWC_t is the change in the working capital (i.e. short-term accruals) from year *t–1* to year *t* as indicated in Section 3.2.1. CFO_t denotes operating cash flow of the firm for the year *t*. Further, it is noted that the sample period: 2007 to 2009 allows using actual operating cash flows from the cash flow statement.

As explained in the preceding section, as a point of variation and enhancing the robustness of findings, this study utilizes both a cross-sectional version and the original time-series versions of the D&D model. First, equation (***Eqn. 1***) above was regressed based on a sector specific basis [2] for each period. Then, the coefficients obtained via this procedure was fitted in to equation (***Eqn. 2***) [3] below to obtain the D&D based cross-sectional proxy measure

(which will be herein forth denoted as $AbsD\&D_t$) – which is technically the absolute value of the residual term – on a firm specific basis.

$$AbsD\&D_t = \Delta WC_t - (\alpha_1 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1}) \qquad \textbf{(Eqn. 2)}$$

Next, the time-series version of the D&D model denotes the *standard deviation of the residual* term as the earnings quality proxy measure by regressing equation (***Eqn. 1***) above on a moving average basis and the absolute value of the error term is used as the earnings quality proxy (denoted as $AbsMaD\&D_t$ herein forth) for this research. $AbsMaD\&D_t$ is estimated using a 5-year moving average basis that utilizes financial data for the period 2001 to 2010 and the *standard deviation of residual* is estimated for the years: 2007, 2008 and 2009.

These two D&D model based earnings quality proxy measures ($AbsD\&D_t$ and $AbsMaD\&D_t$) are used alternatively as the dependent variable for the cross-sectional regression specification proposed under the next section [6]. Next section introduces the analyses suggested under this research.

3.3 Wilcoxon Signed Rank test, Cross-sectional Regression Model and Hypothesis Testing

In order to compare the earnings quality of firms with audit committees and firms without audit committees (i.e. matched based on industry sector and size as explained in Section 3.1), the nonparametric Wilcoxon Signed Rank test is proposed and used for this study. Zhang, Zhou and Zhou (2007) indicate that Wilcoxon Signed Rank test (that is based on the median for the comparison) is the analog of the paired sample *t*-test [7]. Under Wilcoxon Signed Rank test, the null hypothesis is that firms with audit committees and firms without audit committees are not different on a statistically significant basis.

Furthermore, a multivariate regression analysis is suggested to control for alternative explanations. Regression equation (***Eqn. 3***) below denotes the multivariate regression model specification that is suggested for the ordinary least squares (OLS) regression analysis in testing the hypothesis indicated under section 2.3 by pooling the firm-year observations both firms with and without audit committees. In this suggested model, the main independent variable is the dummy variable: audit committee existence or absence (denoted as $AcDum_t$). As explained in the preceding Section 3.2.4, both the cross sectional version and time-series version of the D&D measures (i.e. $AbsD\&D_t$ and $AbsMaD\&D_t$) will be used alternatively to investigate the expected relation and hence utilized as the alternative dependent variables.

In the depicted regression model (***Eqn. 3***); control variables such as size, earnings, leverage etc. of the listed companies are included based on related extant empirical literature (see Lin & Hwang, 2010) that indicates such as significant factors, and depending on the relevancy to the context [18].

$$AbsD\&D_t / AbsMaD\&D_t = \alpha_0 + \alpha_1 AcDum_t + \alpha_2 LnTA_t + \alpha_3 EBEI_t + \alpha_4 Lever_t + \alpha_5 ToBRD_t + \alpha_6 ToOutRto_t + \varepsilon_t \quad \textit{(Eqn. 3)}$$

Where [13]: $AbsD\&D_t$ denotes absolute value of the cross-sectional version of the D&D model based earnings quality proxy measure for the period t. The *alternative* proxy measure $AbsMaD\&D_t$ denotes the absolute value of the *standard deviation of the residual term* estimated on a 5-year moving average basis for the years: 2007, 2008 and 2009 (see Section 3.2.4).

As explained before, $AcDum_t$ denotes the dummy variable representing the existence or absence of an audit committee at the year t, in which, "0" represents the firm not having an audit committee and "1" represents the firm having an audit committee, at year t. $LnTA_t$ denotes natural logarithm of the average total assets of the firm for year t [19]. $EBEI_t$ denotes the net income adjusted with extra ordinary items for year t (as discussed in Section 3.2.1) [13]. $Lever_t$ denotes the financial leverage defined as total liabilities at year t divided by total assets at year t.

Finally, $ToBRD_t$ represents the total number of directors in the board of directors at year t, while $ToOutRto_t$ denotes the outside director ratio for year t computed as total outside directors in the board of directors divided by total directors in the board of directors.

It should be noted that $AcDum_t$ is the main independent variable under consideration of this research. The next section explains the expected model predictions.

3.4 Empirical Predictions

In terms of the model predictions for the multivariate regression specification elaborated in the preceding section; since the existence of an audit committee (as against the conventional corporate auditor system) variable ($AcDum_t$) is coded as "1" and the absence is coded as "0", a *negative sign* is expected in the coefficient of $AcDum_t$ in the pooled regression results. This is because that the increase in the dependent earnings quality variable (i.e. either $AbsD\&D_t$ or $AbsMaD\&D_t$) characterizes poor earnings quality as increases in those variables depict increasing variability of accruals that leads to higher estimations errors and hence,

poor level of earnings quality.

Next section elaborates the findings of this research that utilizes the research strategies proposed under this section.

4. Findings and Discussion

This section elaborates in detail of the descriptive statistics and the findings of the nonparametric test conducted for comparison and the pooled multivariate regression analysis.

4.1 Descriptive Statistics

Descriptive statistics [10] are indicated in Exhibit 1 for the both groups of industry and size matched samples of firms without audit committees (Panel A) and with audit committees (Panel B).

Exhibit 1: Descriptive Statistics for the Samples with and without Audit Committees

Panel A

Descriptive statistics for firms without audit committee

	n	*Mean*	*SD*	*1st Quartile*	*Median*	*3rd Quartile*
$LnTA_t$	84	12.0569	1.4625	10.8144	12.2110	13.0973
$EBEI_t$	84	0.0295	0.0448	0.0125	0.0325	0.0528
$Lever_t$	84	0.5088	0.2283	0.3630	0.5420	0.6796
CFO_t	84	0.0573	0.0426	0.0296	0.0507	0.0822
$TACC_t$	84	-0.0278	0.0533	-0.0506	-0.0276	-0.0008
ΔWC_t	84	-0.0022	0.0454	-0.0269	-0.0020	0.0253
$AbsD\&D_t$	84	0.0233	0.0250	0.0044	0.0179	0.0317
$ToBRD_t$	84	10.3571	3.8547	7.5000	10.0000	12.0000
$ToOutRto_t$	84	0.0598	0.1025	0.0000	0.0000	0.1000

Panel B

Descriptive statistics for firms with audit committee

	n	*Mean*	*SD*	*1st Quartile*	*Median*	*3rd Quartile*
$LnTA_t$	84	12.0649	1.4682	10.8122	12.2268	13.0829
$EBEI_t$	84	0.0122	0.0734	0.0055	0.0357	0.0503
$Lever_t$	84	0.5135	0.2098	0.3695	0.5231	0.6520
CFO_t	84	0.0501	0.0735	0.0307	0.0669	0.0892
$TACC_t$	84	-0.0379	0.0614	-0.0640	-0.0353	0.0140
ΔWC_t	84	0.0065	0.0757	-0.0142	0.0015	0.0401
$AbsD\&D_t$	84	0.0328	0.0437	0.0061	0.0197	0.0383
$ToBRD_t$	84	8.2619	2.3291	7.0000	8.0000	10.0000
$IoOutRto_t$	84	0.4856	0.1331	0.3750	0.4286	0.6000
$AcOutRto_t$	83	0.7685	0.1505	0.6667	0.6667	1.0000

In the above exhibit, Panel A depicts descriptive statistics for firms without audit committees, while Panel B indicates statistics for firms with audit committees. The definitions of the variables are stated in Sections 3.2 and 3.3. *n* represents firm-year observations per sample.

As was explained in Section 3.1, in pursuant of the extant literature, the matching was done based on same industry sector [12] and average total assets of the respective firms. Hence, the natural logarithms of the average total assets ($LnTA_t$) [19] and the related standard deviations (SD) of both groups are thereby approximately the same. Moreover, it could be noted that operating cash flows (CFO_t) and leverage ($Lever_t$) of the both groups are also approximately similar while net income adjusted with extraordinary items ($EBEI_t$) of firms without audit committees is observed to be higher than their counterpart group. It is also noted that total accruals ($TACC_t$) have no major difference between the groups. The change in working capital (ΔWC_t) – i.e. short-term accruals – is having a larger difference between the two groups of firms, however [11].

Importantly, it is also noted that there is a higher outsider director ratio in the group with audit committees (for both board level: $ToOutRto_t$ and audit committees level: $AcOutRto_t$) while their average board size is quite smaller in comparison to traditional governance set-ups [12]. This is seen as natural to expect due to similar provisions and requirements set by the Commercial Code (2002) on these dimensions. These characteristics of both groups (i.e. firms with and without audit committees) are expected to provide a fair platform for comparison. The control variables: industry sector, size of the firms, leverage and operating cash flows are approximately the same and the matched samples differ mainly based on earnings quality related variables (i.e. earnings and short-term accruals) and the governance variables.

Table 1 depicts the correlation matrix (i.e. *Pearson's* correlation) that explains the relations between variables. It is interesting to note that there is a positive relation (as against the prediction stated in Section 3.4) between the earnings quality measure: $AbsD\&D_t$ and the audit committee dummy variable: $AcDum_t$, on a univariate basis. It is noted that the relation is not statistically significant, however.

Table 1: Correlation Matrix

	$AbsD\&D_t$	$AcDum_t$	$TACC_t$	ΔWC_t	$LnTA_t$	$EBEI_t$	CFO_t	$Lever_t$	$ToBRD_t$	$ToOutRto_t$
$AbsD\&D_t$	1									
$AcDum_t$	0.1322	1								
$TACC_t$	-0.1089	-0.0873	1							
ΔWC_t	-0.0357	0.0701	0.6507 **	1						
$LnTA_t$	0.1183	0.0027	0.0249	0.0819	1					
$EBEI_t$	-0.2331 **	-0.1419	0.4907 **	0.2919 **	0.1875 *	1				
CFO_t	-0.1335	-0.0607	-0.4578 **	-0.3258 **	0.1675 *	0.5500 **	1			
$Lever_t$	0.2034 **	0.0109	0.1368	0.0446	0.3615 **	0.0271	-0.1035	1		
$ToBRD_t$	-0.0594	-0.3142 **	0.1097	-0.0303	0.3840 **	0.2037 **	0.1027	0.2446 **	1	
$ToOutRto_t$	0.1658 *	0.8745 **	-0.0892	0.0647	-0.0566	-0.2333 **	-0.1525 *	0.0027	-0.3479 **	1

** Significant at 1% * Significant at 5%.

This table depicts the Pearson's correlation coefficients for the core variables utilized under this study. The definitions of the variables are stated in Sections 3.2 and 3.3.

Further, we could observe a statistically significant (p<.01) strong positive relation (i.e. 0.8745) between existence of an audit committee ($AcDum_t$ = "1") and the overall outside director ratio ($ToOutRto_t$). This relation is observed to be in consequent to the Commercial Code (2002) that requires deployment of outside directors as the majority of the audit committee (and other committees), but did not require such for boards of traditional board of auditors. Therefore, the observed strong positive relationship between these two variables could be seen as natural to expect [8]. Furthermore, a statistically significant (p<.01) negative relation is noted between the size of the board of directors and ($ToBRD_t$) and existence of an audit committee ($AcDum_t$ = "1") [12].

Having investigated the descriptive statistics and correlations, the analysis and discussion is furthered into the comparison between the two groups of firms, which is discussed next.

4.2 Comparison between the Industry and Size matched Groups

The comparison between the industry and size matched firm-year observations for firms with audit committees and without audit committees is depicted in Table 2, which uses the Wilcoxon Signed Rank test as the analytical method for comparison on an annual as well as on a pooled basis. The basis of comparison is the earnings quality proxy: $AbsD\&D_t$.

Based on the p-value (see last column), we cannot reject the null hypothesis that the firms are different with statistical significance both on an annual as well as pooled sample basis. In other words, the results indicate that firms with audit committees and without audit committees are not different on a statistically significant basis.

Furthermore, exactly the same conclusions derived under Table 2 are observed for annual firm-year comparisons as well as for the total firm-year comparison (results not tabulated) for the alternative time-series version of the D&D model based earnings quality measure: $AbsMaD\&D_t$, which uses 59 industry and size matched firm-years and tested using again the Wilcoxon Signed Rank test.

Table 2: Comparison of firms with and without Audit Committees: Wilcoxon Signed Rank test

	*n**	*z-value*	*p-value*
Annual Sample Comparison			
2007	28	-1.2520	0.2104
2008	30	-1.2650	0.2059
2009	26	-0.3940	0.6938
Pooled Sample Comparison	84	-1.6810	0.0927

This table indicates the *z*-values and *p*-values that are ascertained by comparing firms without and with audit committees. The comparison is based on earnings quality measure: $AbsD\&D_t$.
*n represents observations per matched sample.

It should be cautioned that the Wilcoxon Signed Rank test compares the firms with and without audit committees on a univariate basis and results thereon might be influenced by other cofounding variables, which may give rise to alternative explanations. This necessitates a robust multivariate analysis, which is elaborated in the next section.

4.3 Multivariate Regression Analysis

Table 3 reports the results of the multivariate regression analysis that was proposed in Section 3.3. After controlling for several alternative explanations [8], it could be observed that the expected negative sign (see Section 3.4) between the existence of audit committees ($AcDum_t$ = "1") and both of earnings quality proxies ($AbsD\&D_t$ and $AbsMaD\&D_t$), respectively. A negative sign was predicted as a decrease of these proxies means lesser estimation errors and thereby higher earnings quality.

Table 3: Multivariate Regression Analysis

Dependent Variable →	*AbsD&D$_t$*				*AbsMaD&D$_t$*			
	Coef.	*Std. Error*	*t-value*	*p-value*	*Coef.*	*Std. Error*	*t-value*	*p-value*
$AcDum_t$	-0.0025	0.0110	-0.22	0.8240	-0.0141	0.0095	-1.49	0.1360
$LnTA_t$	0.0032	0.0021	1.54	0.1260	0.0004	0.0017	0.21	0.8340
$EBEI_t$	-0.1305	0.0456	-2.86	0.0050	-0.1187	0.0473	-2.51	0.0130
$Lever_t$	0.0296	0.0131	2.26	0.0250	0.0023	0.0113	0.20	0.8390
$TcBRD_t$	-0.0008	0.0009	-0.88	0.3820	-0.0011	0.0008	-1.37	0.1740
$TcOutRto_t$	0.0182	0.0231	0.79	0.4310	0.0545	0.0218	2.50	0.0140
Constant	-0.0193	0.0227	-0.85	0.3960	0.0221	0.0185	1.20	0.2330
n	168				118			
Adj. R-squared	0.0922				0.1171			
Model f-value	3.83				3.59			
Model p-value	0.0014				0.0027			

The table indicates the results for the pooled multivariate regression analysis performed using the suggested model under Section 3.3 for the D&D model based alternative earnings quality proxy measures: $AbsD\&D_t$ and $AbsMaD\&D_t$ as the dependent variable, respectively. The definitions of all the variables are stated in Sections 3.2 and 3.3.

No statistical significance, however, is observed between the existence of an audit committees ($AcDum_t$ = "1") and earnings quality proxies. Therefore, it *cannot* be established that firms having audit committees have superior earnings quality compared to firms that do not have audit committees, where the latter group of firms utilizes the traditional corporate auditor system for its financial monitoring function. The possible reasons for this finding are discussed in the next section.

4.4 Discussion

The nonparametric Wilcoxon Signed Rank test indicating that the both groups are not significantly different and the multivariate analysis finding a non statistically significance relation between earnings quality and existence of an audit committee leads to an important discussion, which is elaborated next.

Saito (2009) finds that the introduction of outside directors to a firm which has already outside directors have a lesser significant impact on a firm's operating performance and value, than introducing at least one outside director to a firm that has no outside directors at all. He observes that in the latter case, there is a very high significance in the increment of the firm's operational performance and value. In the same token, this argument leads to the inference that *mere* introduction of *outside directors* would have a diminishing marginal impact on increasing financial reporting quality and thereby the earnings quality as well.

Further, extant research has indicated that outside directors having *financial expertise* is one of the important factors for the effectiveness of audit committees (Lin & Hwang, 2010; DeZoort & Salterio, 2001). In the Japanese context, there is no regulation that requires outside directors to have financial qualifications or expertise to be admitted to boards, let alone audit committees. Kawamura (2008) indicates that it is extremely difficult *in reality* to find outside directors with suitable business expertise and managerial expertise for Japanese firms. Saito (2009) indicates that Federation of Economic Organizations (*Keidanren*) strongly opposed even introducing outside directors under the revised Commercial Code (2002) due to two reasons; first being that outside directors were not well suited to executing a useful function in the highly relational Japanese corporate affairs and secondly, the difficulty in finding outside directors with *suitable experience*.

Hirata (2004) indicates that the audit committee of Sony had all three directors (two outside directors and one inside director) with financial expertise in compliance with Sarbanes-Oxley Act. He further explains that, however, despite the same committee system is being implemented, there are differences of governance systems of firms based on

management policy and strategy, corporate culture, business environments etc.

Furthermore, the results of a survey conducted by the Japan Corporate Auditors Association (JCAA, 2004) involving listed and non-listed firms, indicates interesting findings on establishing the committee system including audit committees. Out of the 936 listed companies who responded, only 1.7% have either implemented or considered to implement the committee system. Moreover, out of the firms who had already implemented such committee system, only 21.4% indicated that the audit committee could be considered superior to the conventional corporate auditor system for monitoring purposes. In addition, their findings indicate that out of the firms that did not want to implement the committee system, 41.8% believed that conventional auditor system is very suitable for their contexts.

When considered the issues discussed in the preceding paragraphs, two mutually inclusive issues could be inferred as follows, which are believed to cause lesser statistical significance observed in analyses performed in Sections 4.2 and 4.3:

a. The objective of establishing audit committees:

The above discussion may indicate that firms who had already established audit committees and other firms trust conventional corporate auditor system rather than audit committees for financial monitoring. Audit committees are mainly deployed with outside directors who primarily address the *independence* concern as a part of *corporate governance* mechanism. The main role of an audit committee as a *financial monitor* seems questionable in contrast to the US context.

b. Resources and expertise of audit committees:

Furthermore, it may be inferred that resources and expertise [13] of audit committees may lack to execute due financial monitoring leading to lower financial monitoring and reporting quality.

Investigating these concerns calls for in-depth case-study nature of research that should take into consideration several internal characteristics of audit committees such as resource allocation, expertise, authority, reporting structure, and (more importantly) the objective of establishing audit committees.

5. Robustness and Additional Tests

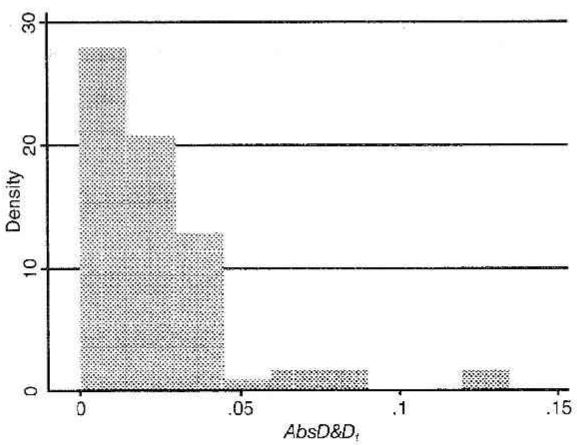
This section elaborates the details and results obtained by additional robust tests performed. First the result of the bootstrap procedure is illustrated, which is followed by a discussion of results of an alternative model on earnings quality.

5.1 Bootstrap Procedure

Figure 1 indicates the histogram drawn on the frequencies of the cross-sectional version of the D&D earnings quality proxy measure: $AbsD\&D_t$ on the sample not having audit committees (which represents the *population*). Since it is highly skewed, in addition to the Wilcoxon Signed Rank test results (indicated in Section 4.2), further testing should be considered.

Furthermore, as per Exhibit 1, the $AbsD\&D_t$ measure differs between the two samples in terms of standard deviation (*SD*) as well. This situation warrants a bootstrap testing procedure (Noreen, 1989) to investigate whether there is a significant difference between firms with audit committees and firms without such audit committees (see Dichev & Tang, 2009).

Figure 1: Histogram on the frequency of $AbsD\&D_t$ measure



The above figure indicates the histogram drawn for the absolute value of the cross-sectional D&D earnings quality measure: $AbsD\&D_t$ for the sample not having audit committees (n=84).

Hence, median value is used for the bootstrap simulation as the mean value is skewed (see Figure 1). The results are indicated in Table 4.

Table 4: Results for Bootstrap test

Confidence Level	n	Replications	Observed Coef.	z-value	p-value	Normal-based Interval	
						Lower	Upper
@95%	84	1000	0.0179	7.43	0.0000	0.0132	0.0226
@99%	84	1000	0.0179	7.43	0.0000	0.0117	0.0241

The above table depicts the normal-based lower and upper boundaries derived via the bootstrap simulation procedure for the median value at both 95% and 99% confidence intervals. The simulation is based on the sample firms with no audit committees (i.e. which represents the *population*).

As per Panel B in Exhibit 1, the median value for $AbsD\&D_t$ measure for the sample firms having audit committees is 0.0197. According to Table 4, based on the results for the normal-based boundaries for the median value, it is observed that there is *no significant difference* between the two groups of firms (firms with audit committees and without) as the value 0.0197 falls within the boundaries at both 95% and 99% confidence intervals. This again confirms the results and discussion elaborated under Sections 4.2, 4.3 and 4.4.

5.2 Modified Jones model, Wilcoxon Signed Rank test and Multivariate Regression Analysis

Dechow, Sloan and Sweeney (1995) indicates that the cross-sectional version of the modified Jones model (Jones, 1991; Dechow et al., 1995) provides a basis for the estimation of *discretionary accruals* and thereby provides an accrual based proxy measure for earnings quality of an entity. Accordingly, as for establishing robustness, discretionary accruals are estimated using Modified Jones model that is indicated in (***Eqn. 4***).

$$TACC_t = \alpha_0 + \beta_1 \Delta ADJREV_t + \beta_2 PPE_t + \varepsilon_t \qquad \textit{(Eqn. 4)}$$

Where [3]: $TACC_t$ is the total accruals for period t (see Section 3.2 for the definition). $\Delta ADJREV_t$ is the difference in changes in sales and accounts receivable, PPE_t is property, plant, and equipment, which is measured at net book value at year t.

Non-discretionary accruals (denoted as $NDAJ_t$) for the year t is estimated using the coefficient parameters that are estimated by regressing (***Eqn. 4***) above on a cross-sectional industry sector [2] specific basis and then fitting these coefficients to (***Eqn. 4***) on a firm specific basis. $DACJ_t$ below is the denotation of discretionary accruals for the year t, which is the difference between total accruals: $TACC_t$ (see Section 3.2) and non-discretionary accruals: $NDAJ_t$, and is calculated using equation (***Eqn. 5***) as follows:

$$DACJ_t = TACC_t - NDAJ_t \qquad \textit{(Eqn. 5)}$$

The absolute value (as discretionary accruals can be managed either positively or negatively) of the estimated discretionary accruals calculated using above equation: (***Eqn. 5***) is used as the earnings quality proxy (i.e. $AbsDACJ_t$) for the additional analysis discussed next.

Table 5 reports the Wilcoxon Signed Rank test results that compare the industry and size matched firm-year observations with and without audit committees on an annual as well as a pooled basis using the earnings quality measure: $AbsDACJ_t$ (i.e. the absolute value of the discretionary accruals) as the basis of comparison [14]. Despite the median values of $AbsDACJ_t$ for the firms without audit committees is higher than firms with audit committees (results not tabulated), consistent and confirming the results and conclusions arrived at Section 4.2, it is observed that there is no statistically significant difference (see the *p*-value column of Table 5) between firms with and without audit committees.

Due to the necessity to control for alternative explanations, however, a more robust multivariate regression analysis is performed to confirm the relation between earnings quality and the existence of audit committees.

Table 5: Comparison of firms with and without Audit Committees: Wilcoxon Signed Rank Test

	*n**	*z-value*	*p-value*
Annual Sample Comparison			
2007	30	0.7100	0.4779
2008	30	-1.1000	0.2712
2009	29	-1.2870	0.1982
Pooled Sample Comparison	89	-1.0290	0.3035

This table indicates the *z*-values and *p*-values by comparing firms without and with audit committees based on earnings quality proxy measure: $AbsDACJ_t$.
**n* represents observations per matched sample.

For the purposes of the regression analysis and testing the hypothesis indicated under section 2.3, the absolute value of $DACJ_t$ (i.e. $AbsDACJ_t$) is used as the dependent variable in regression equation (***Eqn. 6***) that is based on the multivariate regression model specification introduced under Section 3.3 and 3.4 (all other independent variables are the same [8]). The results are indicated in Table 6.

$$AbsDACJ_t = \alpha_0 + \alpha_1 AcDum_t + \alpha_2 LnTA_t + \alpha_3 EBEI_t + \alpha_4 Lever_t + \alpha_5 ToBRD_t + \alpha_6 ToOutRto_t + \varepsilon_t \quad \textit{(Eqn. 6)}$$

Table 6: Multivariate Regression Analysis

	Coef.	*Std. Error*	*t-value*	*p-value*
$AcDum_t$	-0.0018	0.0139	-0.13	0.8960
$LnTA_t$	0.002*	0.0025	0.83	0.4050
$EBFI_t$	-0.1557	0.0573	-2.72	0.0070
$Lever_t$	0.0518	0.0161	3.22	0.0020
$ToBRD_t$	0.0003	0.0012	0.29	0.7750
$ToOutRto_t$	0.0181	0.0292	0.62	0.5350
Constant	-0.0150	0.0273	-0.55	0.5850
n	178			
Adj R-squared	0.0971			
Model f-value	4.17			
Model p-value	0.0006			

Above table indicates the results for the multivariate regression performed using the proposed model under Section 3.3 with the exception of the usage of the alternative earnings quality measures: $AbsDACJ_t$ as the dependent variable. The definitions of the variables are stated in Sections 3.2, 3.3 and 5.2.
The sample firm-years are increased to 178 from 168 (as was indicated in Section 3.1) due to additional firm-years having information for the earnings quality measure: $AbsDACJ_t$ under each group.

Regression results depicted in Table 6 above further confirms the results that had been obtained under the multivariate regression analysis performed and reported under Section 4.3 (see Table 3 for the findings that uses both $AbsD\&D_t$ and $AbsMaD\&D_t$ as the earnings quality proxy measures alternatively as the dependent variable). It is observed in Table 6, that the audit committee dummy variable: $AcDum_t$ is having the expected negative sign (see Section 3.4) with the earnings quality measure: $AbsDACJ_t$. The relation, however, is ***not statistically significant*** and therefore, it cannot be concluded that firms having audit committees are possessing higher earnings quality than the listed companies that do not have audit committees, which confirms the findings in Section 4.3.

Having confirmed the results obtained under the main analyses by the robustness tests discussed under this section, the paper proceeds in summarizing the findings and concluding the paper under the next section.

6. Summary, Conclusion and Future Directions

6.1 Summary and Conclusions

This research study empirically evaluated the audit committee system, which was introduced as a part of the contemporary reforms of the Japanese corporate governance system, using accruals based earnings quality proxies of firms listed in Tokyo Stock Exchange for the period 2007 to 2009, over the traditional corporate auditor system.

The multivariate regression results reported in Section 4.3 indicated that there is no statistically significant relation between earnings quality (operationalized using both the cross-sectional and time-series versions of the Dechow & Dichev [2002] model) and existence of an audit committee. Consistent with this finding, the same lack of statistical significance is observed under the Modified Jones model (Dechow, Sloan & Sweeney, 1995), which operationalizes earnings quality based on discretionary accruals (Section 5.2). The lack of statistical significant relations observed in above analyses under both operationalizations is corroborating the findings of the univariate Wilcoxon Signed Rank nonparametric analyses (Sections 4.2 and 5.2) and the bootstrap testing procedure (Section 5.1), which again indicate the lack of significant difference between firms with audit committees, and traditional firms who had not adopted audit committees. Accordingly, it is not able to conclude that firms that have audit committees have higher quality of earnings compared with their counterparts (i.e. firms with the traditional corporate auditor system).

As per the discussion under Section 4.4, the observed lesser significance raises concerns over objective, resources and expertise of audit committees in functioning as financial monitors. The emphasis on *independence* (i.e. by deploying outside directors) is inferred to overshadow the role of an audit committee as a *financial monitor* in contrast to the US context.

The findings and conclusion of this study is expected to have significant policy implications over the deployment of appropriate directors to corporate boards in enhancing broadly the financial reporting function as well as more specifically the earnings quality of firms they serve.

6.2 Limitations and Future Research Directions

The current study evaluated the inherently limited sample of listed firms based on accrual based earnings quality proxies. Hence, the generalization of the findings and

conclusions of this study should be done with caution. It should be noted that despite the research had used well-accepted accrual based proxies to determine the quality of earnings, the term earnings quality is itself is a very board construct and extant research has used several alternative proxies to operationalize it. Therefore, in terms of future research directions, it is suggested to use other bases for the evaluation with a broader sample scope that expands beyond listed firms of Tokyo Stock Exchange to non-listed firms as well. Furthermore, the causality between audit committees leading to higher quality of earnings may be questionable in certain instances, although there is overwhelming conceptual and empirical basis and evidence such causality as discussed in Section 2.2.

Finally, it is suggested to perform an in-depth case-study nature of research in evaluating the objective, resources and expertise (of outside and inside directors) pertaining to audit committees, in order to evaluate their function as a financial monitor as there may be other important alternative explanatory variables other than considered under this research.

[Notes]

[1] Complying with the extant empirical research practice, banking corporations, insurance companies and other financial institutions are excluded under this research due to significant differences in financial statements and being highly regulated industries.

[2] The Tokyo Stock Exchange classification has 33 industry categories and this research uses the 24 merged and adjusted classification (which also excluding financial firms as per *endnote* 1 above) proposed by Kubota, Suda and Takehara (2010) as for maintaining the consistency with the computations of the cross-sectional versions of the earnings quality measures stated in sections 3.2.4 and 5.2.

[3] Variables are standardized using the simple average of the total assets at year t and t-1 as per the extant literature.

[4] In order to investigate the issue of possible articulation problem raised by Hribar and Collins (2002), an analysis was performed to investigate whether the firm-year observation for firms with and without audit committees by using the net of the extraordinary items. The absolute values of the net of extraordinary items were divided by the absolute value of adjusted net income (i.e. *EBEI*). This index was then compared between the two sample groups (i.e. firm-year observations of firms with and without audit committees) as well as with the same index estimated for the total firm-years of all industrial companies listed in Tokyo Stock Exchange for the period 2007 to 2009. It is observed (results not tabulated) that the both groups (i.e. firm-year observations of firms with and without audit committees) are not contaminated with extreme net extraordinary items. Therefore, the possible articulation problem is expected to be minimal. Further, this minimal effect is confirmed again indirectly by obtaining the almost similar regression results reported under Table 6 in section 5.2 by using the balance sheet approach to estimate the total accruals (results not tabulated) instead of the income statement approach.

[5] Since it is beyond the scope of this paper to discuss related concept of earnings quality and related proxies

at a length, the interested reader is directed towards the work of Dechow, Ge and Schrand (2010).

[6] Both the cross-sectional version and the time-series versions are used to control for cross sectional variations as well as to capture the true essence of the original D&D model, respectively. Further, this procedure is expected serves as a robustness check of D&D model itself.

[7] The paired sample *t*-test (that uses the difference in means as the basis for the comparison) is not suitable to be used in the absence of the assumption of normal distribution of the earnings quality measures proposed under this study. In Exhibit 1 of Section 4.1 as well as in Figure 1 of Section 5.1, the mean value of the primary earnings quality measure: $AbsD\&D_t$ suggest the absence of this assumption.

[8] Under Section 4.1, it is observed that there is a significant positive correlation between existence of an audit committee ($AcDum_t$ = "1") and the overall outside director ratio ($ToOutRto_t$), and these two variables have been used as independent variables for the multivariate regression analyses under Section 4.3 and 5.2. This high correlation necessitates considering the issue of possible multicollinearity between these two variables (as well as other variables). Hence, multicollinearity diagnostics were performed inclusive of Variance Inflation Factor (VIF) analysis and all VIF factors are well below the acceptable level of 10, and therefore multicollinearity is not seen as a problem (see Krishnan & Lee, 2009).

[9] The natural logarithm of the average total assets is used due to addressing the heteroskedastic effects and skewed nature of average total assets data.

[10] The definitions of the variables depicted are provided in Sections 3.2 and 3.3.

[11] Using the D&D Model as the proxy for representing earnings quality is further justified by this fact as this model estimates earnings quality based on current accruals.

[12] Saito (2009) indicates that larger board sizes and lesser outside directors in boards of directors in traditional governance set-ups. Commercial Code (2002) requires majority of directors to be outside directors in the three committees, i.e. in audit committee, compensation committee and nomination committee.

[13] The financial expertise of outside directors have been appreciated using different criteria in extant literature related to the Japanese context as directors from the main-bank etc. These measures, however, are seen as imprecise and some are now getting less significant (see Miwa & Ramseyer, 2005, for the diminishing role of main-banking system as a monitoring mechanism). Due to this fact, lack of other suitable precise proxy and smaller sample size of this study, the reliance of *inference* is expected to provide better insights than using an imprecise proxy for a study of this nature.

[14] As discussed in *endnote 7* above, the justification of usage of this test as the basis of comparison is similar to $AbsD\&D_t$, the $AbsDACJ_t$ used in this section (i.e. Section 5.2) lacks the assumption for normal distribution (results not tabulated).

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